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Volume 166



USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK

Volume 166

AF/M32T-1 Tester, Pressurized Cabin
Leakage, Aircraft

July 1982

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AEROSPACE MEDICAL DIVISION
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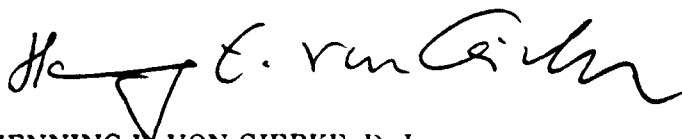
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AMRL-TR-75-50, Vol. 166

This report has been reviewed by the Office of Public Affairs (PA) and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nations.

This technical report has been reviewed and is approved for publication.

FOR THE COMMANDER



HENNING E. VON GIERKE, Dr Ing
Director
Biodynamics and Bioengineering Division
Air Force Aerospace Medical Research Laboratory

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The AF/M32T-1 tester is a gasoline engine driven cabin leakage tester designed to furnish pressurized air to the aircraft at controlled pressures and temperatures during ground pressurization of aircraft cockpits and pressurized compartments. This report provides measured and extrapolated data defining the bioacoustic environments produced by this unit operating outdoors on a concrete apron at normal rated conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred		

speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Far-field data measured at 36 locations are normalized to standard meteorological conditions and extrapolated from 10 - 1600 meters to derive sets of equal-value contours for these same seven acoustic measures as functions of angle and distance from the source. Refer to Volume 1 of this handbook, "USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application," AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc.

PREFACE

This report was prepared by the Biodynamic Environment Branch, Air Force Aerospace Medical Research Laboratory, under Project/Task 723107, Measurement and Prediction of Noise Environments of Air Force Operations.

The author gratefully acknowledges Mr. John N. Cole for his assistance in preparing this report, Mr. Robert G. Powell for his assistance in acquiring the raw data, Mr. Henry T. Mohlman and Mr. Fred D. Lampley of the University of Dayton for their assistance in the mechanics of data processing, and Mrs. Norma J. Peachey who typed and prepared the graphics.

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INTRODUCTION

The AF/M32T-1 is a gasoline engine-driven cabin leakage tester designed to furnish pressurized air to the aircraft at controlled pressures and temperatures during ground pressurization of aircraft cockpits and pressurized compartments. This unit is manufactured by the Sprague Engineering and Sales Company.

This volume provides measured and extrapolated data defining bioacoustic environments produced by this unit. Such data are essential to evaluate ear protection requirements, limiting personnel exposure times, voice communication capabilities, and annoyance problems associated with operations of the AF/M32T-1 tester.

This volume is one of a series published by the Air Force Aerospace Medical Research Laboratory (AFAMRL) under the same report number (AMRL-TR-75-50) as a multi-volume handbook that quantifies the noise environments produced at flight/ground crew locations and in surrounding communities by operations of Air Force aircraft and ground support equipment. The far-field, community-type, noise data in the handbook describe the noise produced during ground operations of aircraft, ground support equipment, and other ground-based equipment or facilities.

Volume 1 of this handbook discusses the objectives and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. Refer to Volume 1 (reference 1) for such information because it is not repeated in other handbook volumes.

A cumulative index lists those aerospace systems contained in the handbook, and identifies the specific volumes containing each type of environment noise data available (i.e., inflight/flight crew and passenger noise, near-field ground crew noise, far-field/community noise). Volume numbers are assigned sequentially as individual volumes are published. This index is periodically updated as individual volumes are published and is available upon request from AFAMRL/BBE, Wright-Patterson AFB, OH 45433. Organizations on the distribution list for the handbook will automatically receive a copy of each updated index as it is generated.

Direct any questions concerning the technical data in this report and other handbook volumes to: AFAMRL/BBE, Wright-Patterson AFB, OH 45433; AUTOVON 78-53675 or 78-53664; Commercial (513) 255-3675 or (513) 255-3664.

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1. Cole, John N., USAF Bioenvironmental Noise Data Handbook, Volume 1: Organization, Content and Application. AMRL-TR-75-50(1), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, 1975.

NEAR-FIELD NOISE

MEASUREMENTS

A standard AF/M32T-1 tester was operated outdoors on a concrete apron at a normal rated condition of 2,400 RPM with no significant sound-reflective surfaces present except the ground plane. Table 1 notes the surface meteorological conditions at the time of measurement.

Figure 1 identifies 72 noise measurement locations at a height of 1.5 meters above the concrete apron (nominal ear level of ground crew). The 0 degree reference direction passes through the tow bar. The 36 locations on the two inner circles are in the acoustic near-field of the source where the sound wave fronts generally do not spherically diverge and the source appears to be spatially distributed (i.e., not a point source). Consequently, these near-field data cannot be extrapolated to longer distances but do properly define the levels at locations close to the unit.

Near-field measurements were also made at ear level at the operator control panel. Table 1 lists the numeric/alphabetic designator used on the data pages in this report to identify the operator measurement location and test condition. The designator 1/A means operator location 1 and test condition A. Such a descriptor is essential in many handbook volumes that involve multiple combinations of locations/conditions. It is used in this report to maintain format consistency.

RESULTS

The measured data presented in Table 2 define the sound pressure levels (SPL) produced by the AF/M32T-1 unit at the 37 specified, near-field locations. This table includes the overall, 1/3 octave band, and octave band levels. From these data one can calculate the variety of measures in Table 3 which are widely used to assess the effects of noise on personnel and their performance.

For data at other intermediate near-field locations (i.e., for radial distances less than 10 meters) you can interpolate between the 72 measured data points. All near-field data are for the meteorological conditions at the time of test but are valid for all typical airbase meteorology because of the short distances over which the sound is propagated.

TABLE 1

MEASUREMENT LOCATIONS AND TEST CONDITIONS FOR OPERATOR NOISE MEASUREMENTS

AF/M32T-1 Tester, Pressurized Cabin Leakage, Aircraft
Tyndall AFB, 19 June 1980
NSN 4920-00-347-9455, Field # J108

Measurement Location	
1	Operator Control Panel
Operation	
A	2400 RPM
Meteorology	
Temperature	29 °C
Bar Pressure	.761 M Hg
Rel Humidity	69 %
Wind - Speed	3.1 M/Sec (6 Kts)

FAR-FIELD NOISE

MEASUREMENTS

Noise Measurements were also made on the same AF/M32T-1 unit under the same test conditions at the outer circle locations on Figure 1. These 36 locations are in the acoustic far-field of the source where the sound wave fronts spherically diverge and the unit may be regarded as a point noise source. Under these far-field conditions, the measured data can be extrapolated to longer distances.

RESULTS

Table 4 lists the overall and 1/3 octave band SPL measured at the 36 far-field locations under the meteorological conditions at the time of the test. These data were normalized to 10 meters distance and standard meteorological conditions (15C temperature, 70% relative humidity, 0.760 meter Hg barometric pressure) and used to derive the graphic data in Figure 2 which provides a compact summary of the farfield noise characteristics of the AF/M32T-1 tester in a standard format.

These measured data were also used to derive sets of equal noise contours (Figures 3 through 9) describing seven different measures of noise as a function of angle and distance from the source for standard day meteorology. Not the Figure 8 contours identify limiting exposure times for personnel. Missing data points on any of the contours are the result of eliminating measured data which contained excessive influence of spurious background noise present at the time of measurement. In some cases contour levels at these missing data points were estimated and indicated with dashed lines.

TABLE 1 MEASURED SOUND PRESSURE LEVEL (DB)										IDENTIFICATIONS									
2 1/3 OCTAVE BAND																			
NOISE SOURCE/SUBJECT: (OPERATION:)																			
AF/M32T-1 TESTER (2400 RPM)																			
PRESSURIZED CABIN ()																			
LEAKAGE, AIRCRAFT ()																			
NEAR FIELD NOISE LEVELS ()																			

TABLE 2 MEASURED SOUND PRESSURE LEVEL (DB)										IDENTIFICATION:									
1/3 OCTAVE BAND																			
NOISE SOURCE/SUBJECT: (OPERATION:)																			
AF/M32T-1 TESTER (2400 RPM)																			
PRESSURIZED CABIN ()																			
LEAKAGE, AIRCRAFT ()																			
NEAR FIELD NOISE LEVELS ()																			
LOCATION/CONDITION																			
FREQ (HZ)	DISTANCE (M) -->	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	ANGLE (DEG) -->	260	280	300	320	340	0	20	40	60	80	100	120	140					
	CONDITION -->	A	A	A	A	A	A	A	A	A	A	A	A	A					
25																			
31.5																			
40																			
50																			
63																			
80																			
100																			
125																			
160																			
200																			
250																			
315																			
400																			
500																			
630																			
800																			
1000																			
1250																			
1600																			
2000																			
2500																			
3150																			
4000																			
5000																			
6300																			
8000																			
10000																			
OVERALL		91	91	92	93	95	105	103	100	98	98	98	98	97					

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)									
1/3 OCTAVE BAND									
IDENTIFICATION:									
2									OMEGA 3.2
									TEST 8A-000-001
									RUN 03
									25 JAN 82
									PAGE F3
NOISE SOURCE/SUBJECT: (OPERATION:									
AF/M32T-1 TESTER ()									
PRESSURIZED CABIN ()									
LEAKAGE, AIRCRAFT ()									
NEAR FIELD NOISE LEVELS ()									
LOCATION CONDITION									
DISTANCE (M)--> 4 4 4 4 4 4 4 4 4 4									
ANGLE (DEG)--> 160 180 200 220 240 260 280 300 320 340									
CONDITION-----> A A A A A A A A A A									
25	79<	75<	74<	74<	74<	74<	74<	74<	74<
31.5	75<	75<	75<	75<	75<	75<	75<	75<	75<
40	75<	75<	75<	75<	75<	75<	75<	75<	75<
50	76<	77<	77<	77<	77<	77<	77<	77<	77<
63	91	91	88	86	86	86	86	86	86
80	85	84	82	80<	79<	79<	79<	79<	79<
100	77	78	78	78	77	77	77	77	77
125	87	86	86	86	86	86	86	86	86
160	85	85	85	85	85	85	85	85	85
200	83	86	85	85	85	85	85	85	85
250	79	81	80	77	76	75	75	75	75
315	85	83	80	79	79	77	77	77	77
400	83	82	81	81	81	79	79	79	79
500	81	82	92	80	79	79	79	79	79
630	86	84	81	83	79	78	77	77	77
800	81	78	80	78	79	79	78	78	78
1000	79	78	79	78	81	80	80	80	80
1250	75	75	75	75	77	77	77	77	77
1600	75	77	76	77	77	78	77	77	77
2000	76	79	77	77	79	79	76	77	77
2500	77	77	78	77	80	82	79	77	77
3150	75	77	78	80	82	83	81	77	76
4000	75	76	78	80	81	81	80	77	75
5000	74	75	77	79	79	80	77	75	73
6300	73	73	76	77	77	77	76	74	71
8000	74	74	76	77	76	76	74	73	70
10000	69	71	76	75	73	73	71	70	66
OVERALL	95	96	95	95	95	96	98	100	103

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

[illegible]

[illegible]

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)		IDENTIFICATION:									
2	OCTAVE BAND										
NOISE SOURCE/SUBJECT:		OMEGA 3.2									
AF/M32T-1 TESTER		TEST 8A-000-001									
PRESSURIZED CABIN		RUN 03									
LEAKAGE, AIRCRAFT		25 JAN 82									
NEAR FIELD NOISE LEVELS		PAGE J3									
		LOCATION/CONDITION									
FREQ (HZ)	DISTANCE (M)--> ANGLE (DEG)--> CONDITION----	4	4	4	4	4	4	4	4	4	4
		160	180	200	220	240	260	280	300	320	340
31.5	A	82	92	89	87	87	87	89	93	97	81
63		92	89	89	89	89	91	91	94	97	100
125		89	88	87	87	87	87	86	87	87	100
250		88	87	86	86	84	83	84	84	86	85
500		88	87	86	86	84	84	85	86	86	85
1000		84	82	83	82	84	84	85	81	82	82
2000		81	82	81	82	84	85	83	81	82	82
4000		79	81	82	84	85	86	85	82	80	79
8000		77	78	81	81	80	80	80	79	77	74
OVERALL		96	96	95	95	95	95	96	98	100	103
											101

TABLE: MEASURES OF HUMAN NOISE EXPOSURE										IDENTIFICATION:									
3										OMEGA 3.2									
NOISE SOURCE/SUBJECT: (OPERATION:)										TEST BA-000-001									
AF/M32T-1 TESTER (2400 RPM)										RUN 81									
PRESSURIZED CABIN ()										25 JAN 82									
LEAKAGE, AIRCRAFT ()										PAGE M1									
NEAR FIELD NOISE LEVELS ()																			
										</									

TABLE: MEASURES OF HUMAN NOISE EXPOSURE										IDENTIFICATIONS	
3											
NOISE SOURCE/SUBJECT: (OPERATION:)											
AF/M32T-1 TESTER ()										OMEGA 3-2	
PRESSURIZED CABIN ()										TEST BA-000-001	
LEAKAGE, AIRCRAFT ()										RUN 03	
NEAR FIELD NOISE LEVELS ()										25 JAN 82	
										PAGE M3	
HAZARD/PROTECTION											
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DB) AT EAR											
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DB) AT EAR											
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)											
NO PROTECTION											
OASLC											
OASLA											
T											
MINIMUM QPL EAR MUFFS											
OASLA*											
T											
AMERICAN OPTICAL 1700 EAR MUFFS											
OASLA*											
T											
V-51R EAR PLUGS											
OASLA*											
T											
AMERICAN OPTICAL 1700 EAR MUFFS PLUS V-51R EAR PLUGS											
OASLA*											
T											
H-133 GROUND COMMUNICATION UNIT											
OASLA*											
T											
COMMUNICATION											
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)											
PSIL											
ANNOYANCE											
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)											
TONE CORRECTION (C IN DB)											
PNLT											
C											

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)																
1/3 OCTAVE BAND																
DISTANCE = 10 METERS																
NOISE SOURCE/SUBJECT: (OPERATION:) METEOROLOGY:) IDENTIFICATION:)																
AF/N32T-1 TESTER, (2400 RPM) TEMP = 29 C) OMEGA 1.4																
PRESSURIZED CABIN () BAR PRESS = .761 M Hg) TEST BA-000-001																
LEAKAGE, AIRCRAFT () REL HUMID = 69 %) RUN 01																
FAR FIELD NOISE LEVELS ()) PAGE 2																
FREQ (HZ) 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180																
ANGLE (DEGREES)																
25																
31.5																
40																
50																
63	86	87	87	86	85	85	85	85	84	84	84	84	84	84	84	84
80	81	80<	79<	79<	79<	79<	79<	79<	79<	79<	79<	79<	79<	79<	79<	79<
100	74	73	73	73	74	75	74	74	73	73	73	73	73	73	73	73
125	82	83	82	81	82	81	81	80	79	78	77	76	74	73	73	73
160	80	81	80	80	79	78	80	79	79	78	77	75	74	74	74	74
200	75	76	75	75	73	73	73	72	73	74	75	74	71	69	68	67
250	69	68	71	74	72	74	73	72	74	73	72	71	71	70	68	66
315	74	73	76	80	78	80	78	80	81	79	78	77	76	77	75	73
400	68	68	67	67	67	67	69	68	68	68	68	68	68	68	67	65
500	66	65	66	67	64	65	65	64	66	65	65	65	65	66	67	66
630	68	68	71	70	69	69	67	67	68	67	68	67	66	68	69	73
800	70	72	72	73	69	68	66	65	67	68	67	66	66	66	67	65
1000	69	71	71	72	68	70	67	68	65	71	70	68	66	66	67	66
1250	63	67	67	64	64	63	62	62	62	63	64	63	64	63	64	63
1600	68	66	65	66	63	65	64	63	63	62	63	63	63	65	63	63
2000	65	66	65	64	62	62	62	60	62	63	63	62	64	63	63	62
2500	61	61	61	59	58	60	60	60	61	62	62	61	63	62	60	60
3150	60	62	61	61	60	59	60	60	61	61	61	61	61	61	61	60
4000	60	61	59	60	61	60	61	61	62	63	61	61	61	62	62	61
5000	58	58	59	61	58	58	59	60	60	61	59	59	60	61	61	60
6300	57	57	57	58	57	56	58	58	59	58	58	58	58	58	59	57
8000	56	56	57	57	58	56	58	58	59	58	58	58	58	59	59	58
10000	50	50	50	51	50	51	51	53	53	53	53	54	55	56	55	54
OVERALL	90	90	90	90	89	89	89	89	89	88	88	87	87	87	87	86

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)																
1/3 OCTAVE BAND																
DISTANCE = 10 METERS																
NOISE SOURCE/SUBJECT: (OPERATIONS:) METEOROLOGY:)																
AF/M32T-1 TESTER, (2400 RPM) TEMP = 29 C)																
PRESSURIZED CABIN () BAR PRESS = .761 M HG)																
LEAKAGE, AIRCRAFT () REL HUMID = 69 %)																
FAR FIELD NOISE LEVELS ())																
FREQ (HZ) 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350																
25																
31.5																
40																
50																
63																
80																
100																
125																
160																
200																
250																
315																
400																
500																
630																
800																
1000																
1250																
1600																
2000																
2500																
3150																
4000																
5000																
6300																
8000																
10000																
OVERALL																

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

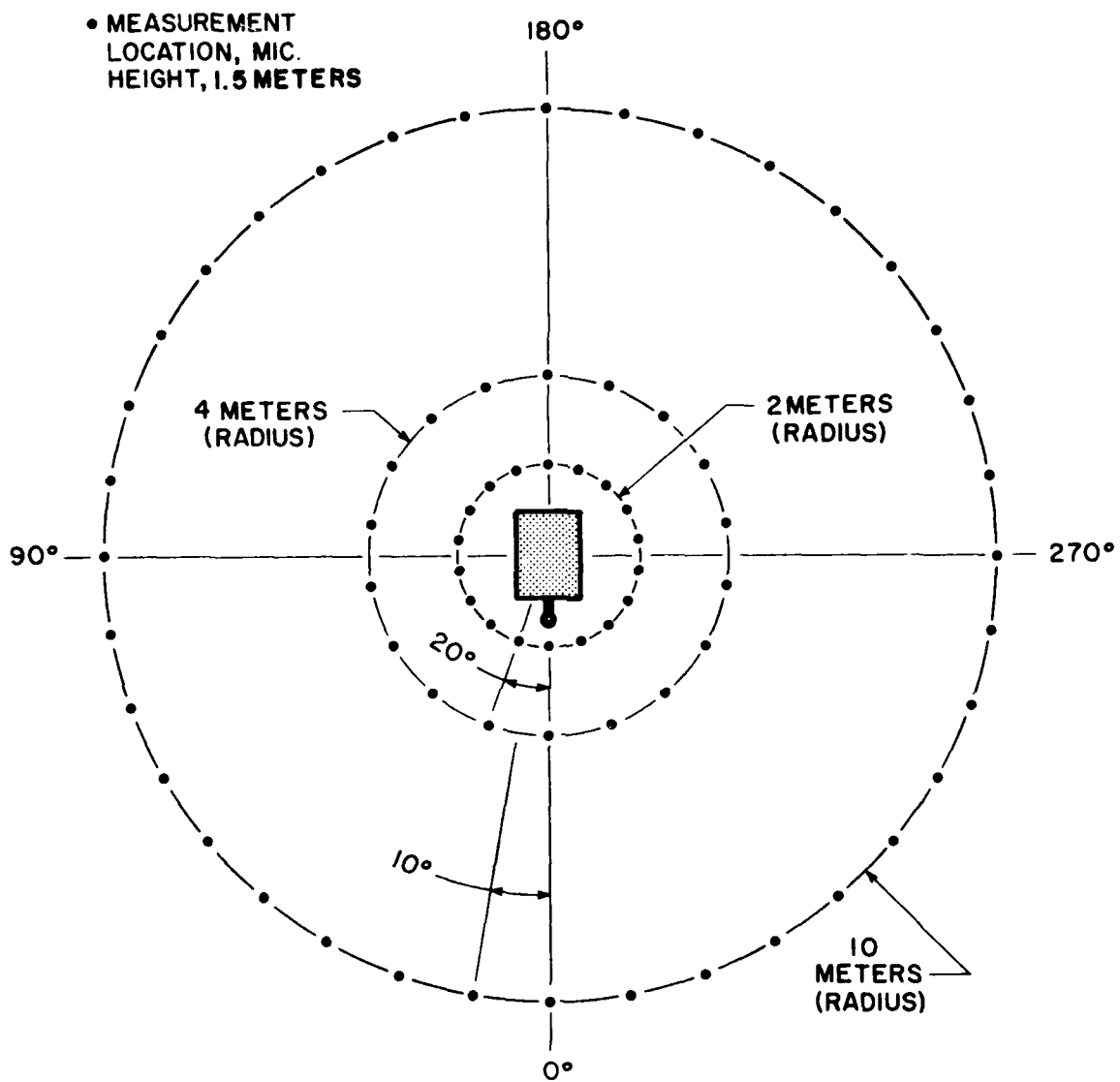
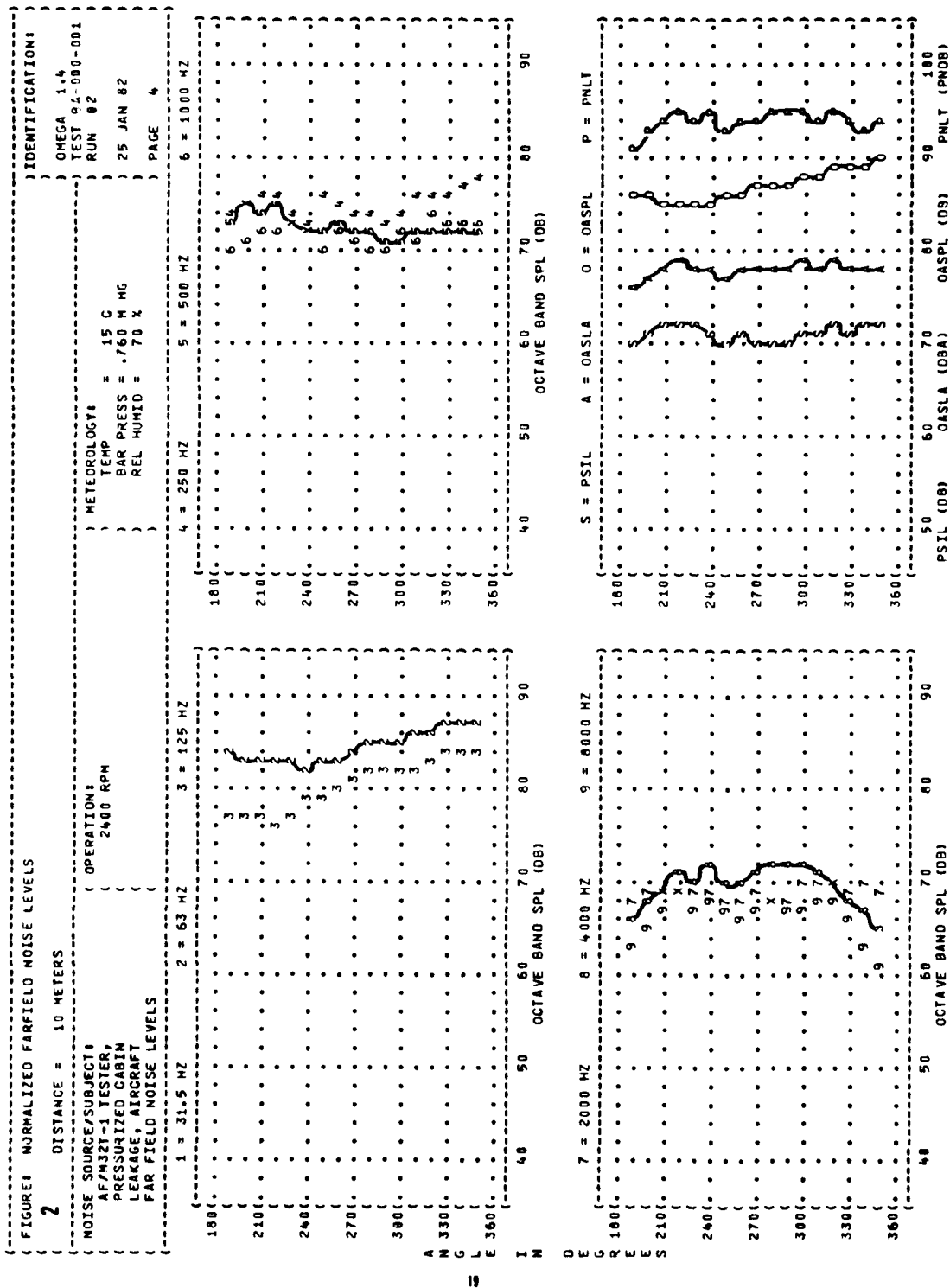
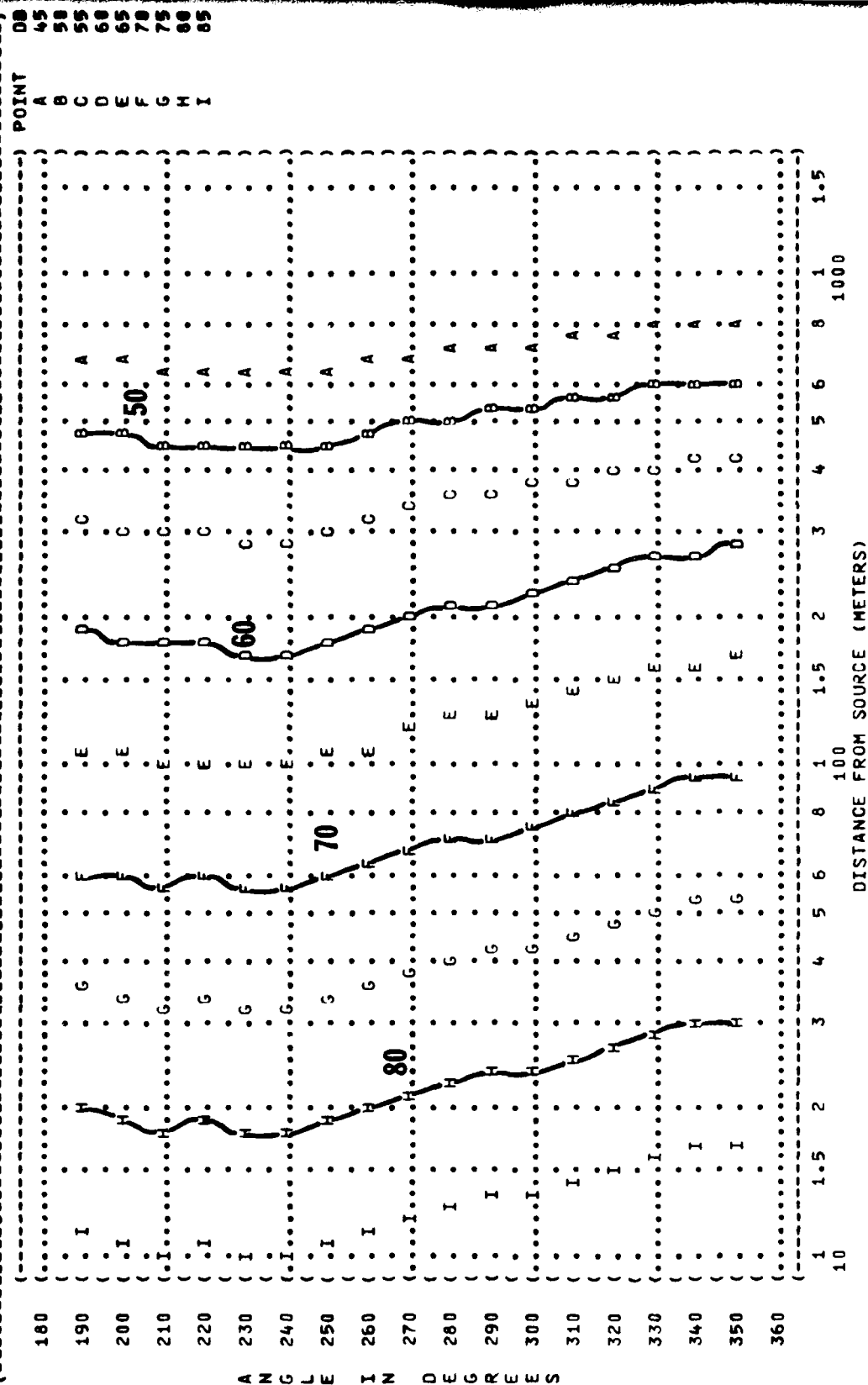
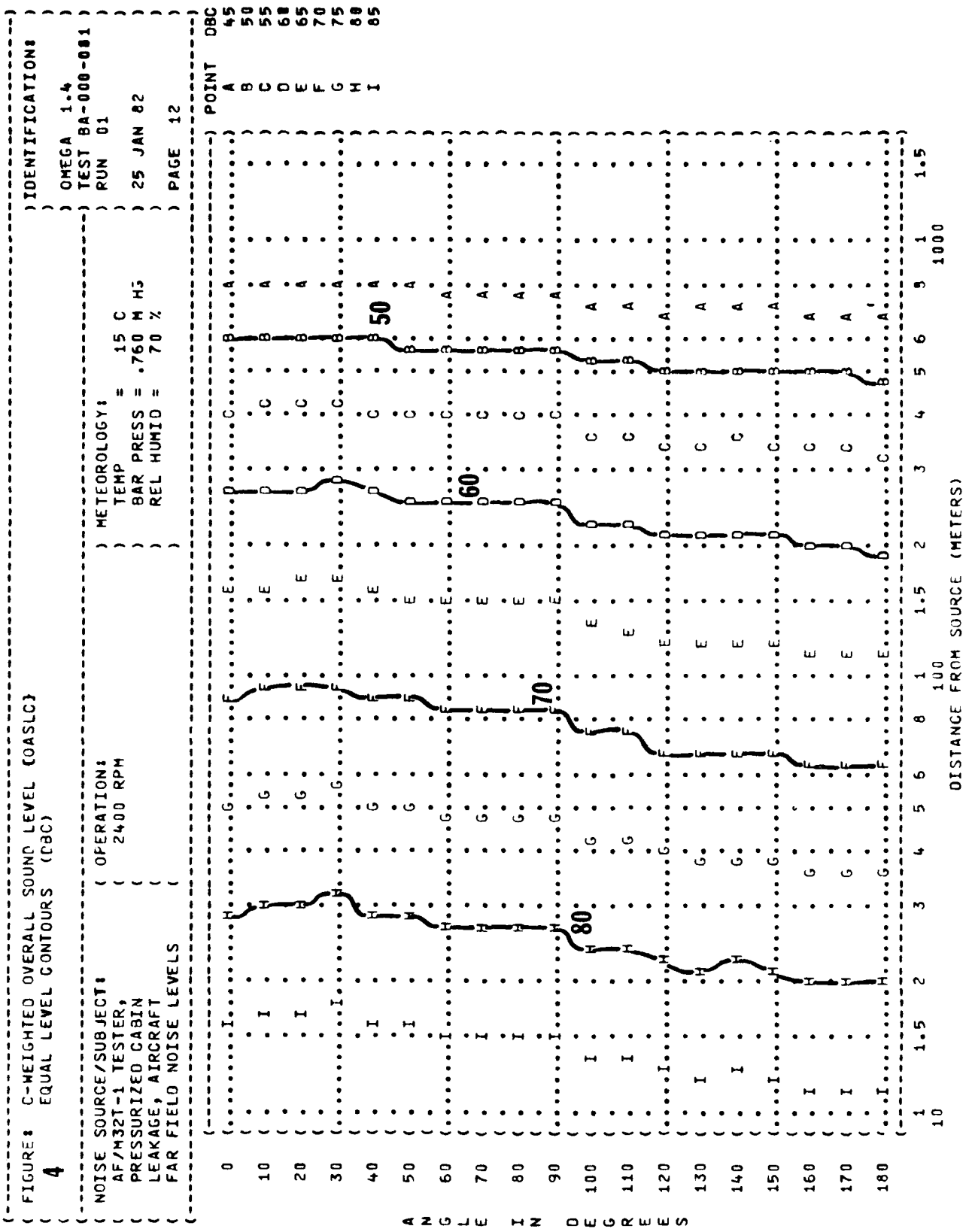


Figure 1. Measurement Locations

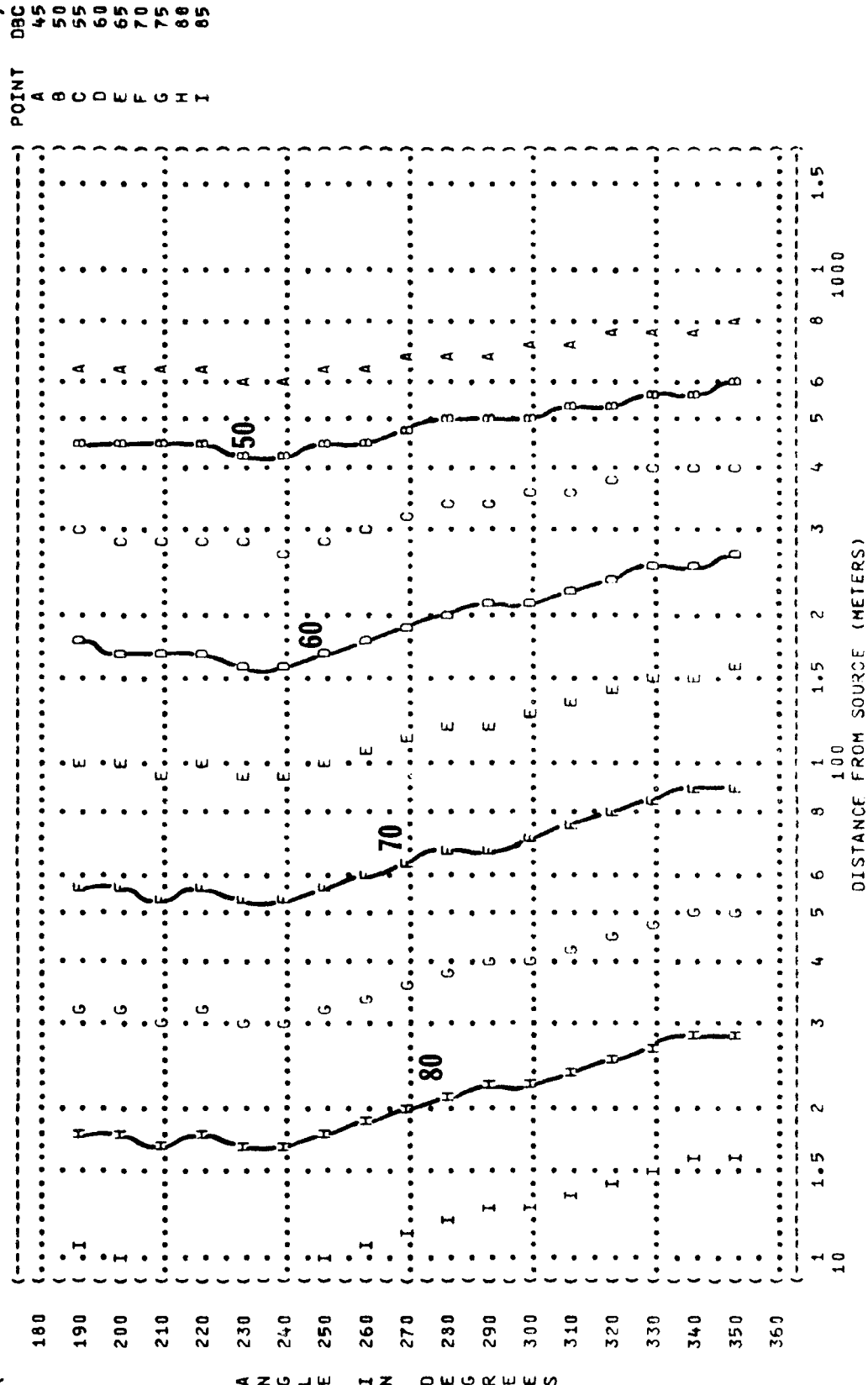


(FIGURE: OVERALL SOUND PRESSURE LEVEL (OASPL))
 (3 EQUAL LEVEL CONTOURS (DB))
 () IDENTIFICATION:)
 () OMEGA 1.4)
 () TEST BA-000-001)
 () RUN 02)
 () METEOROLOGY:)
 () TEMP = 15 C)
 () BAR PRESS = .760 M HG)
 () REL HUMID = 70 %)
 () 25 JAN 62)
 () PAGE 11)
 () NOISE SOURCE/SUBJECT: (OPERATION:)
 (AF/M32T-1 TESTER, (2400 RPM)
 (PRESSURIZED CABIN)
 (LEAKAGE, AIRCRAFT)
 (FAR FIELD NOISE LEVELS ()





(FIGURE: C-WEIGHTED OVERALL SOUND LEVEL (OASLC))
 (4 EQUAL LEVEL CONTOURS (DBC))
 () IDENTIFICATION:)
 () OMEGA 1.4)
 () TEST BA-000-001)
 () RUN 02)
 () METEOROLOGY:)
 () TEMP = 15 C)
 () BAR PRESS = .760 M HG)
 () REL HUMID = 70 %)
 () 25 JAN 82)
 () PAGE 12)



A N G L E I N D E G R E E S

(FIGURE: A-WEIGHTED OVERALL SOUND LEVEL (OASLA)
 (5
 (EQUAL LEVEL CONTOURS (DBA)
 () IDENTIFICATION:
 () OMEGA 1.4
 () TEST BA-000-001
 () RUN 01
 () METEOROLOGY:
 () TEMP = 15 C
 () BAR PRESS = .760 M HG
 () REL HUMID = 70 %
 () 25 JAN 82
 () PAGE 13
 () POINT DBA
 () A 45
 () B 50
 () C 55
 () D 60
 () E 65
 () F 70
 () G 75

(NOISE SOURCE/SUBJECT: (OPERATION:
 (AF/M32T-1 TESTER, (2400 RPM
 (PRESSURIZED CABIN
 (LEAKAGE, AIRCRAFT
 (FAR FIELD NOISE LEVELS (

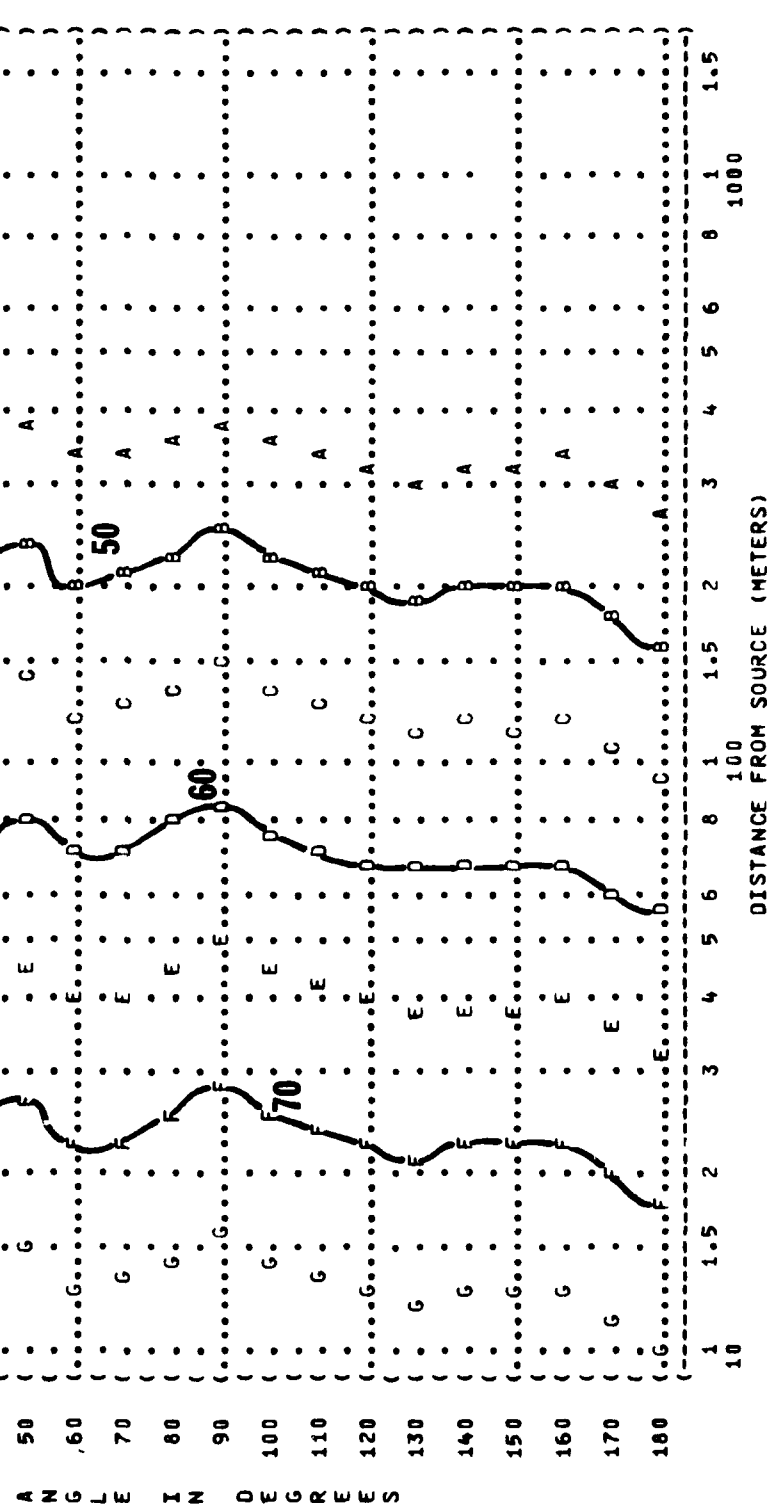
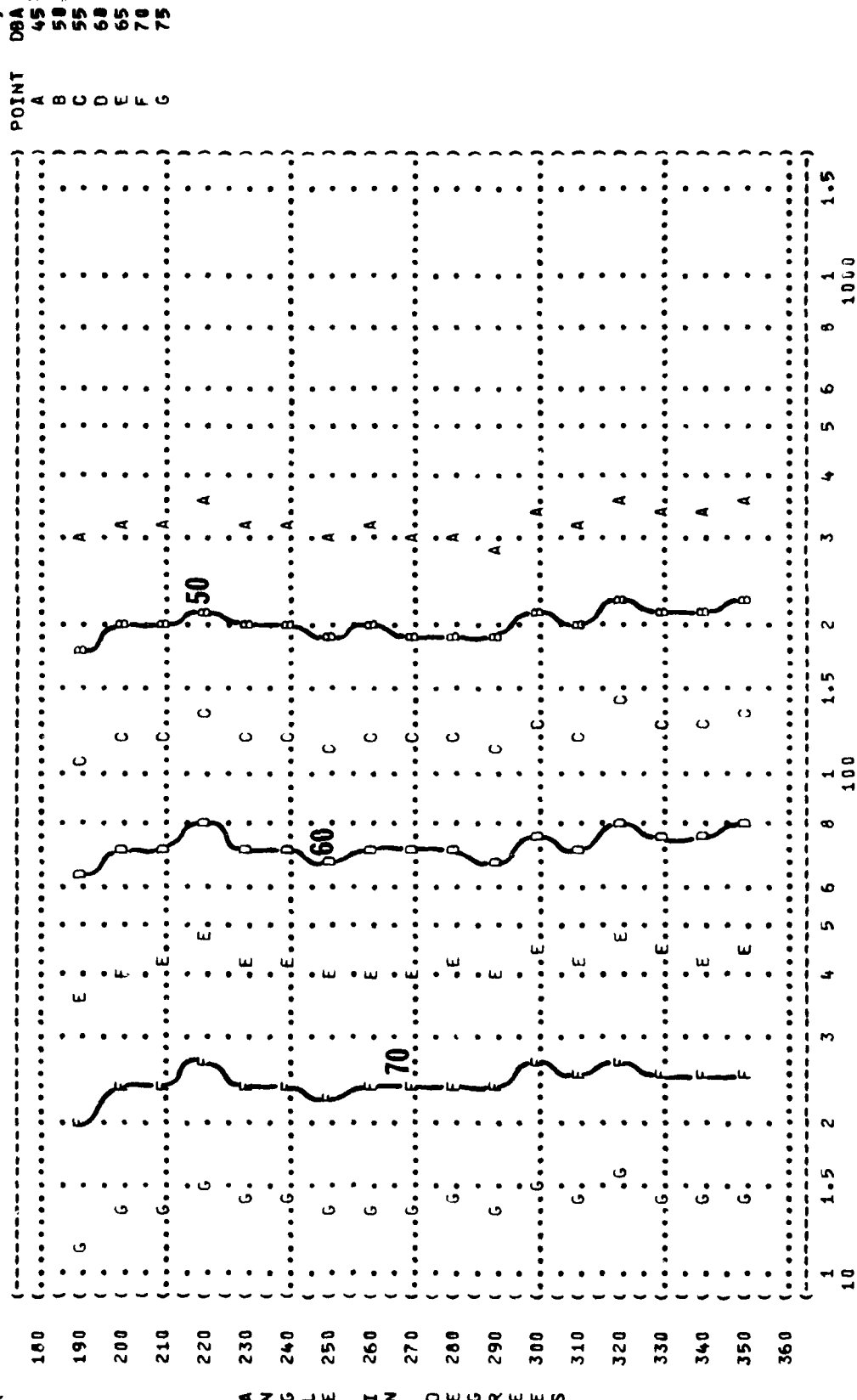


FIGURE: A-WEIGHTED OVERALL SOUND LEVEL (OASLA)
 5
 EQUAL LEVEL CONTOURS (DBA)

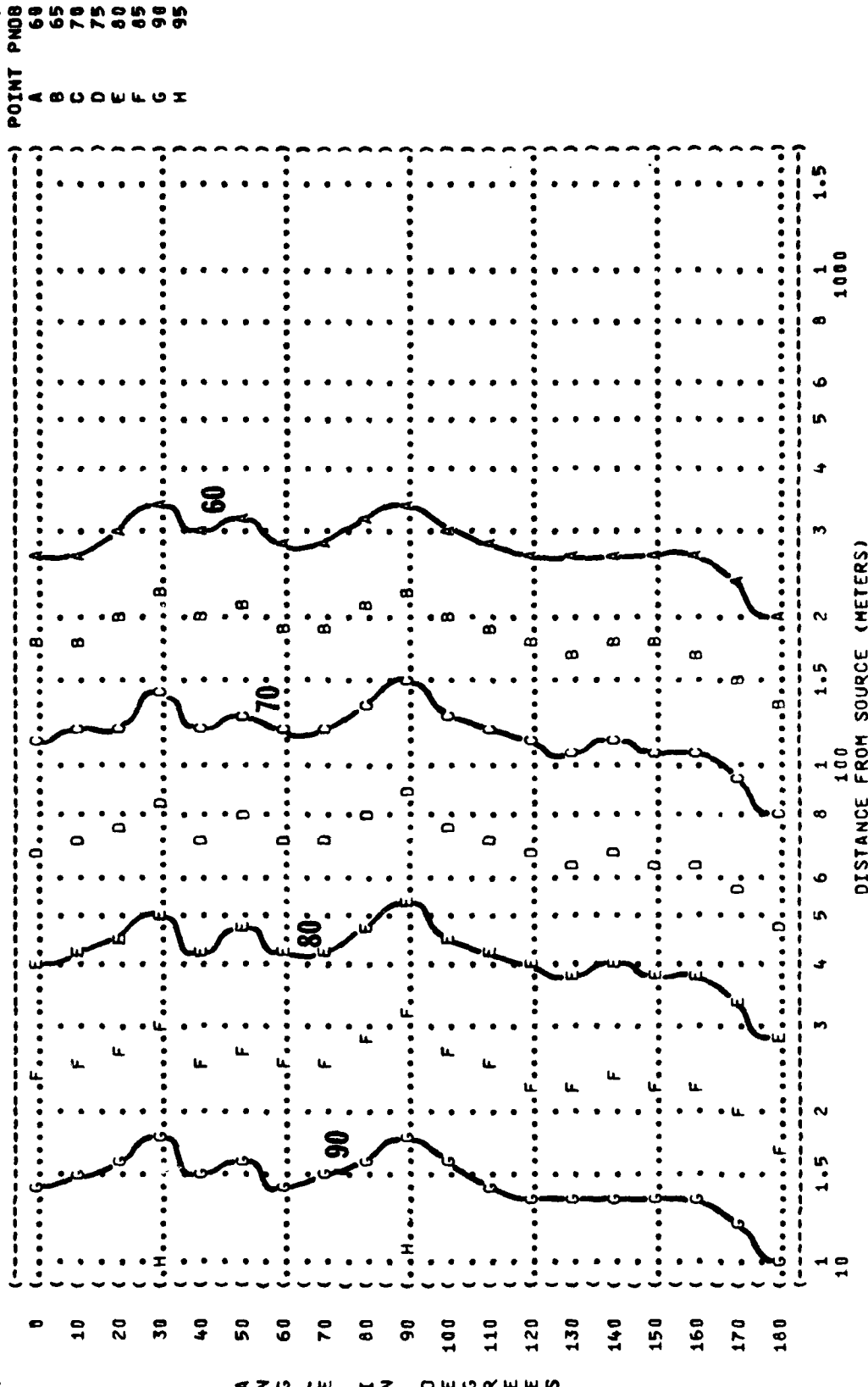
NOISE SOURCE/SUBJECT: () OPERATION: () METEOROLOGY: ()
 AF/M32T-1 TESTER, () 2400 RPM () TEMP = 15 C ()
 PRESSURIZED CABIN () BAR PRESS = .760 M Hg () 25 JAN 62 ()
 LEAKAGE, AIRCRAFT () REL HUMID = 70 % ()
 FAR FIELD NOISE LEVELS () () PAGE 13 ()

IDENTIFICATION: ()
 ()
 () OMEGA 1.4
 () TEST BA-000-001
 () RUN 02

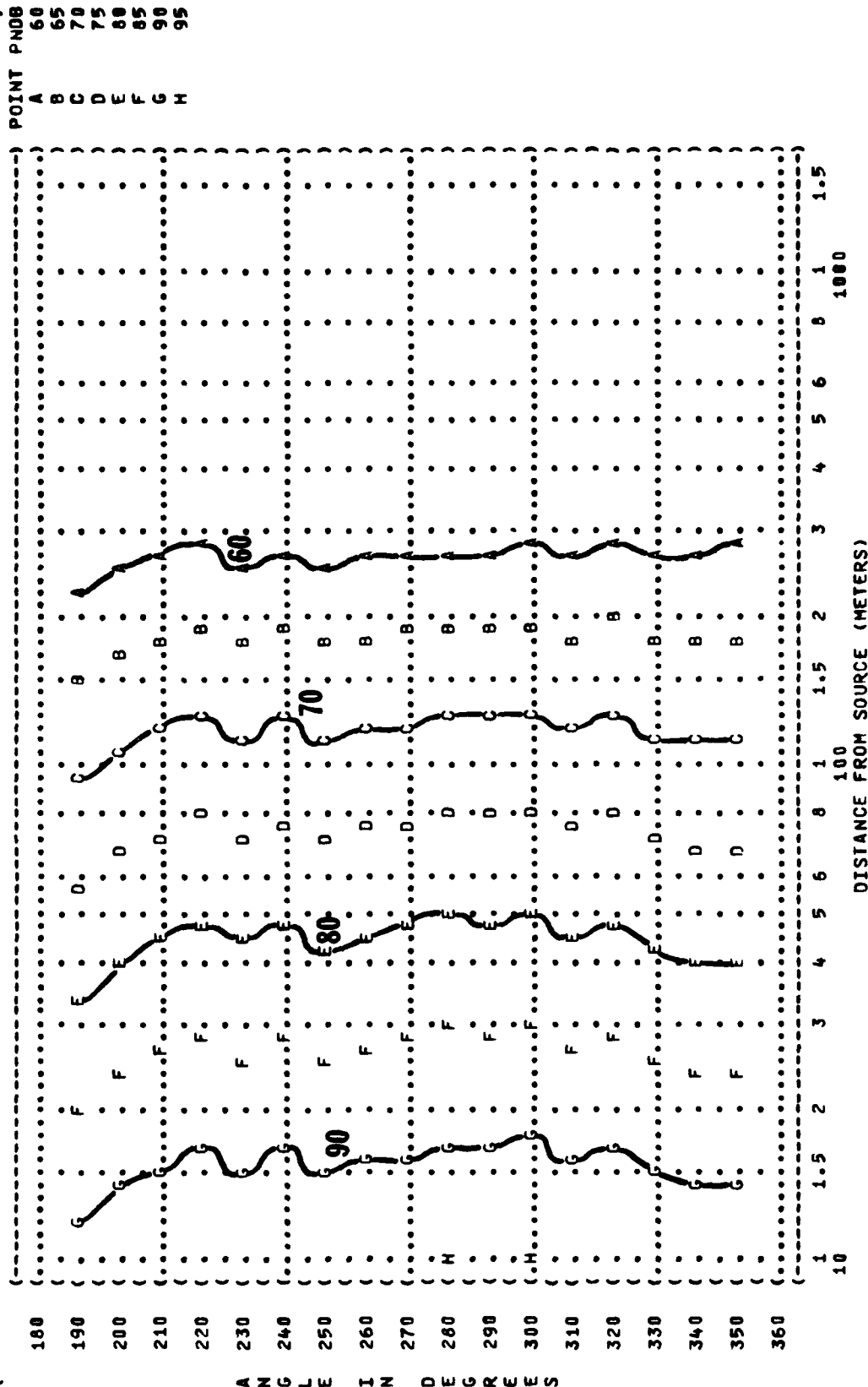


DISTANCE FROM SOURCE (METERS)

(FIGURE: PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT))
 (6 EQUAL LEVEL CONTOURS (PNDB))
 ()
 () IDENTIFICATION:)
 ()
 () OMEGA 1.4
 () TEST BA-000-001
 () RUN 01
 ()
 (NOISE SOURCE/SUBJECT:) METEOROLOGY:)
 (AF/M32T-1 TESTER,) TEMP = 15 C)
 (PRESSURIZED CABIN) BAR PRESS = .760 M HS)
 (LEAKAGE, AIRCRAFT) REL HUMID = 70 %)
 (FAR FIELD NOISE LEVELS))
 () PAGE 14)



(FIGURE: PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT))
 (6 EQUAL LEVEL CONTOURS (PNDB))
 ()
 () IDENTIFICATION:)
 ()
 () OMEGA 1.4)
 () TEST BA-000-001)
 () RUN 02)
 ()
 (NOISE SOURCE/SUBJECT: (OPERATION:)
 (AF/M32T-1 TESTER, (2400 RPM)
 (PRESSURIZED CABIN ()
 (LEAKAGE, AIRCRAFT ()
 (FAR FIELD NOISE LEVELS ()
 ()
 () METEOROLOGY:)
 () TEMP = 15 C)
 () BAR PRESS = .760 M HG)
 () REL HUMID = 70 %)
 ()
 () PAGE 14)
 ()

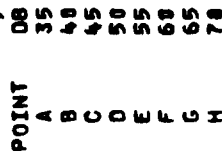



```

IDENTIFICATION:
)
)
) OMEGA 1.4
)
) TEST BA-000-001
)
) RUN 01
)
) 25 JAN 82
)
)
) PAGE 15
)

```

METEOROLOGY:
TEMP = 15 C
BAR PRESS = .760 H HG
REL HUMID = 70 %
RUN 01
25 JAN 82
PAGE 15



(FIGURE: PREFERRED SPEECH INTERFERENCE LEVEL (PSIL)
 (7 EQUAL LEVEL CONTOURS (DB)
 () IDENTIFICATIONS
 () OMEGA 1.4
 () TEST BA-000-001
 () RUN 02
 () 25 JAN 82
 () PAGE 15
 () METEOROLOGY:
 () TEMP = 15 C
 () BAR PRESS = .760 M HG
 () REL HUMID = 70 %
 () NOISE SOURCE/SUBJECT:
 () OPERATIONS:
 () AF/H32T-1 TESTER, 2400 RPM
 () PRESSURIZED CABIN
 () LEAKAGE, AIRCRAFT
 () FAR FIELD NOISE LEVELS

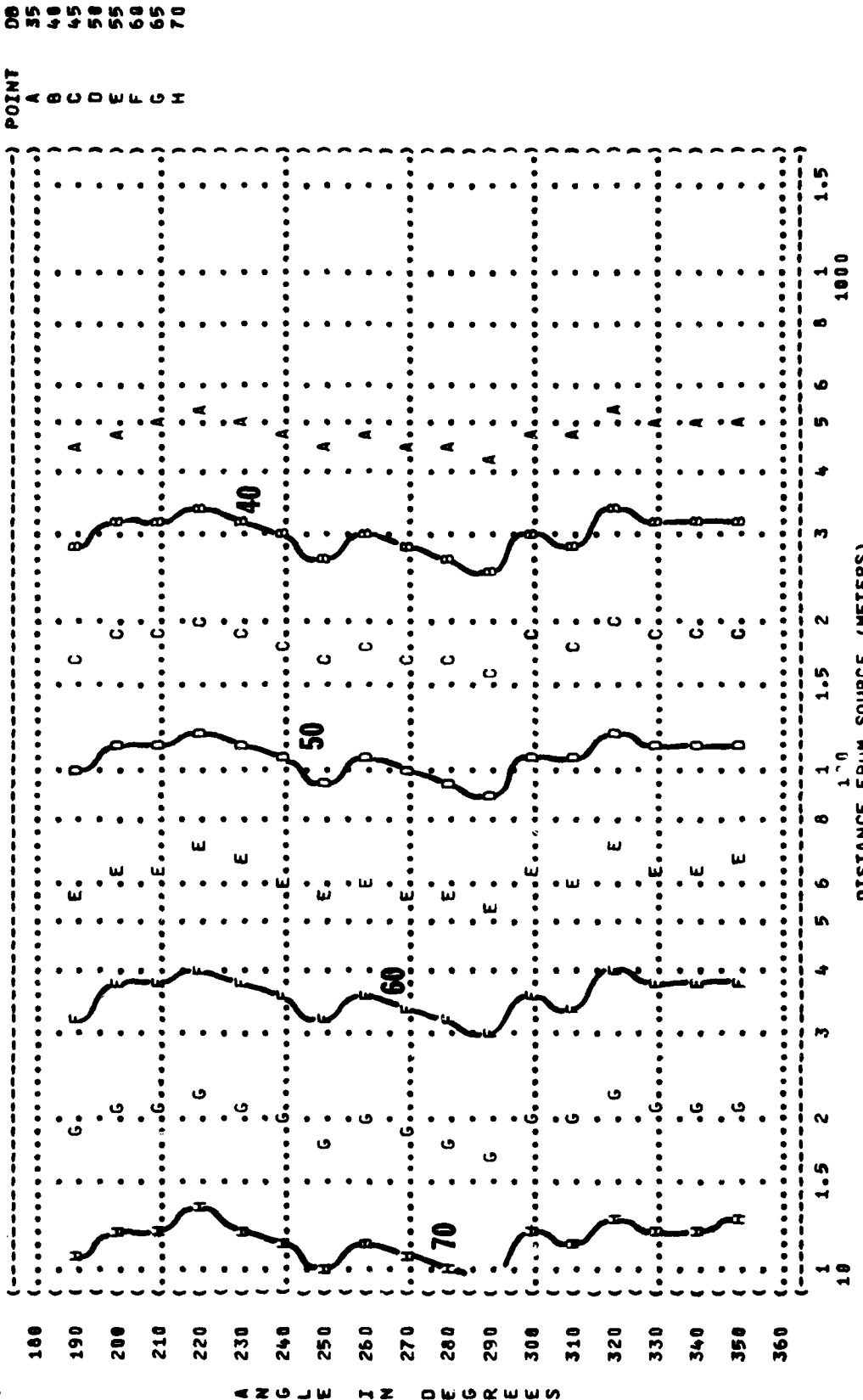


FIGURE 1 MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)

8

IDENTIFICATION:

OMEGA 1.4

TEST BA-000-001

RUN 01

25 JAN 82

PAGE 5

NOISE SOURCE/SUBJECT: (OPERATION:) METEOROLOGY:)

AF/M32T-1 TESTER, (2400 RPM))

PRESSURIZED CABIN ())

LEAKAGE, AIRCRAFT ())

FAR FIELD NOISE LEVELS ())

TEMP = 15 C

BAR PRESS = .760 M HG

REL HUMID = 70 %

PERSONNEL MAY BE EXPOSED UP TO 960 MINUTES PER DAY

AT ALL DISTANCES FROM SOURCE EQUAL TO OR GREATER THAN 10 METERS

FOR ALL ANGLES EVALUATED (INDICATED BY < AT LEFT)

UNDER THE FOLLOWING EAR PROTECTION CONDITIONS:

NO PROTECTION

MINIMUM QPL EAR MUFFS

AMERICAN OPTICAL 1700 EAR MUFFS

V-51R EAR PLUGS

COMFIT TRIPLE FLANGE EAR PLUGS

H-133 GROUND COMMUNICATION UNIT

1 1.5 2 3 4 5 6 8 10 100 1000

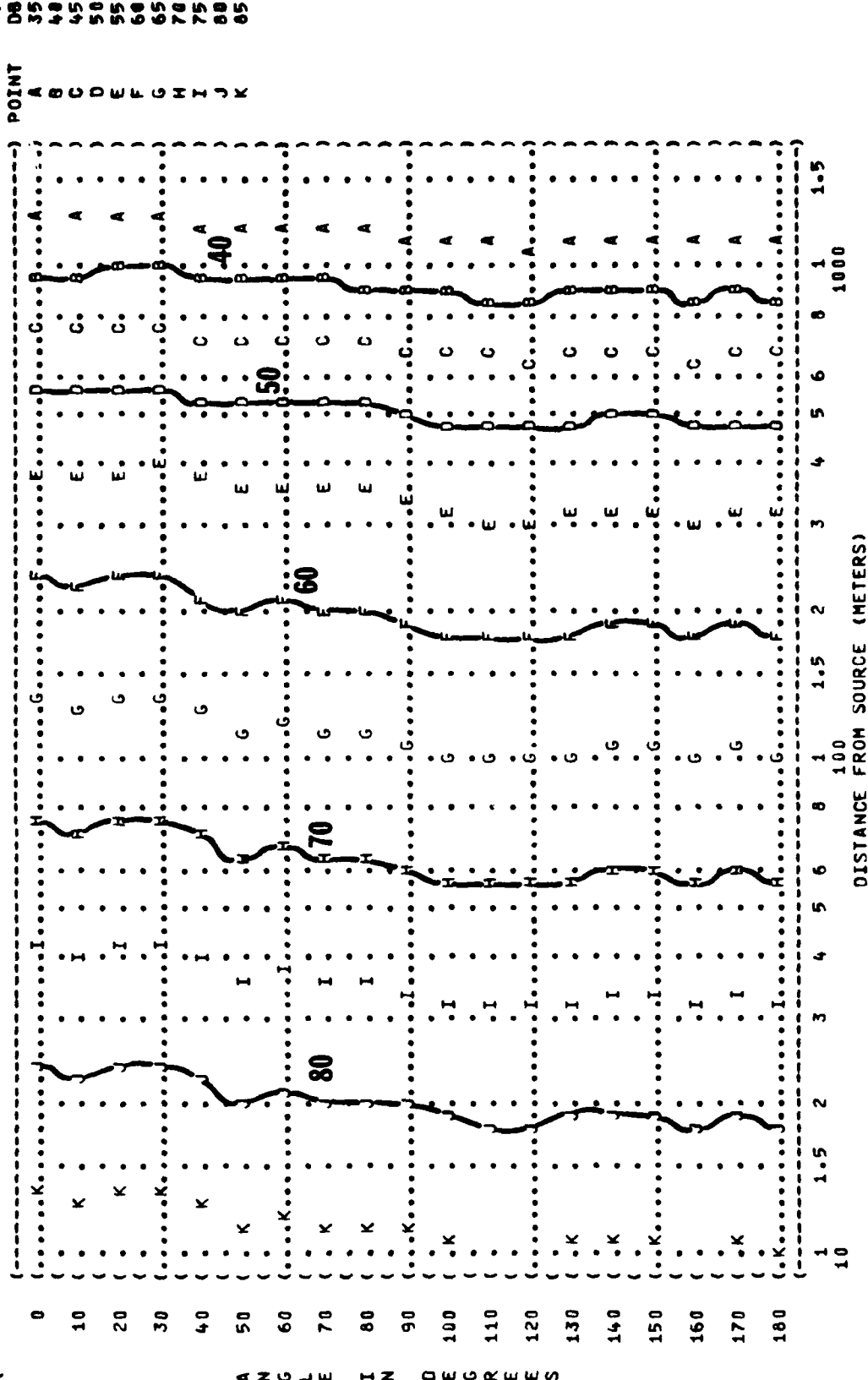
DISTANCE FROM SOURCE (METERS)


```

(-----)
( FIGURE: SOUND PRESSURE LEVEL (SPL) ) IDENTIFICATION:
( 9 ) )
( 31.5 HZ OCTAVE BAND ) )
(-----)
( NOISE SOURCE/SUBJECT: )
( AF/M321-1 TESTER, ) OPERATION: )
( PRESSURIZED CABIN ) 2400 RPM )
( LEAKAGE, AIRCRAFT ) )
( FAR FIELD NOISE LEVELS ) )
(-----)
( )
( )
( ) NO CONTOUR DATA---EITHER NO INPUT DATA WERE COMPUTED (=9999.0)
( ) OR MINIMUM CONTOUR LEVEL REQUESTED IS GREATER THAN MAXIMUM COMPUTED LEVEL.
( )
(-----)

```


() FIGURE: SOUND PRESSURE LEVEL (SPL)
 () 9 EQUAL LEVEL CONTOURS (DB)
 () 63 HZ OCTAVE BAND
 () NOISE SOURCE/SUBJECT: () OPERATION: () METEOROLOGY: ()
 () AF/M32T-1 TESTER, () 2400 RPM () TEMP = 15 C
 () PRESSURIZED CABIN () BAR PRESS = .760 M HG () 25 JAN 82
 () LEAKAGE, AIRCRAFT () REL HUMID = 70 X
 () FAR FIELD NOISE LEVELS () PAGE 17




```
IDENTIFICATION: )
OMEGA 1.4 )
TEST BA-000-001 )
RUN 01 )
```

TEOROLOGY: = 15 C
TEMP = .760 M H3
BAR PRESS = 70 %
REL HUMID =

PAGE 18



(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (9 EQUAL LEVEL CONTOURS (DB)
 (125 HZ OCTAVE BAND
 (NOISE SOURCE/SUBJECT: (OPERATION:
 (AF/M321-1 TESTER, (2400 RPM
 (PRESSURIZED CABIN
 (LEAKAGE, AIRCRAFT
 (FAR FIELD NOISE LEVELS ()
 (IDENTIFICATION:
 () OMEGA 1.4
 () TEST BA-000-001
 () RUN 02
 () TEMP = 15 C
 () BAR PRESS = .760 M HG
 () 25 JAN 82
 () REL HUMID = 70 %
 () PAGE 18
 () POINT DB
 () A 35
 () B 40
 () C 45
 () D 50
 () E 55
 () F 60
 () G 65
 () H 70
 () I 75
 () J 80

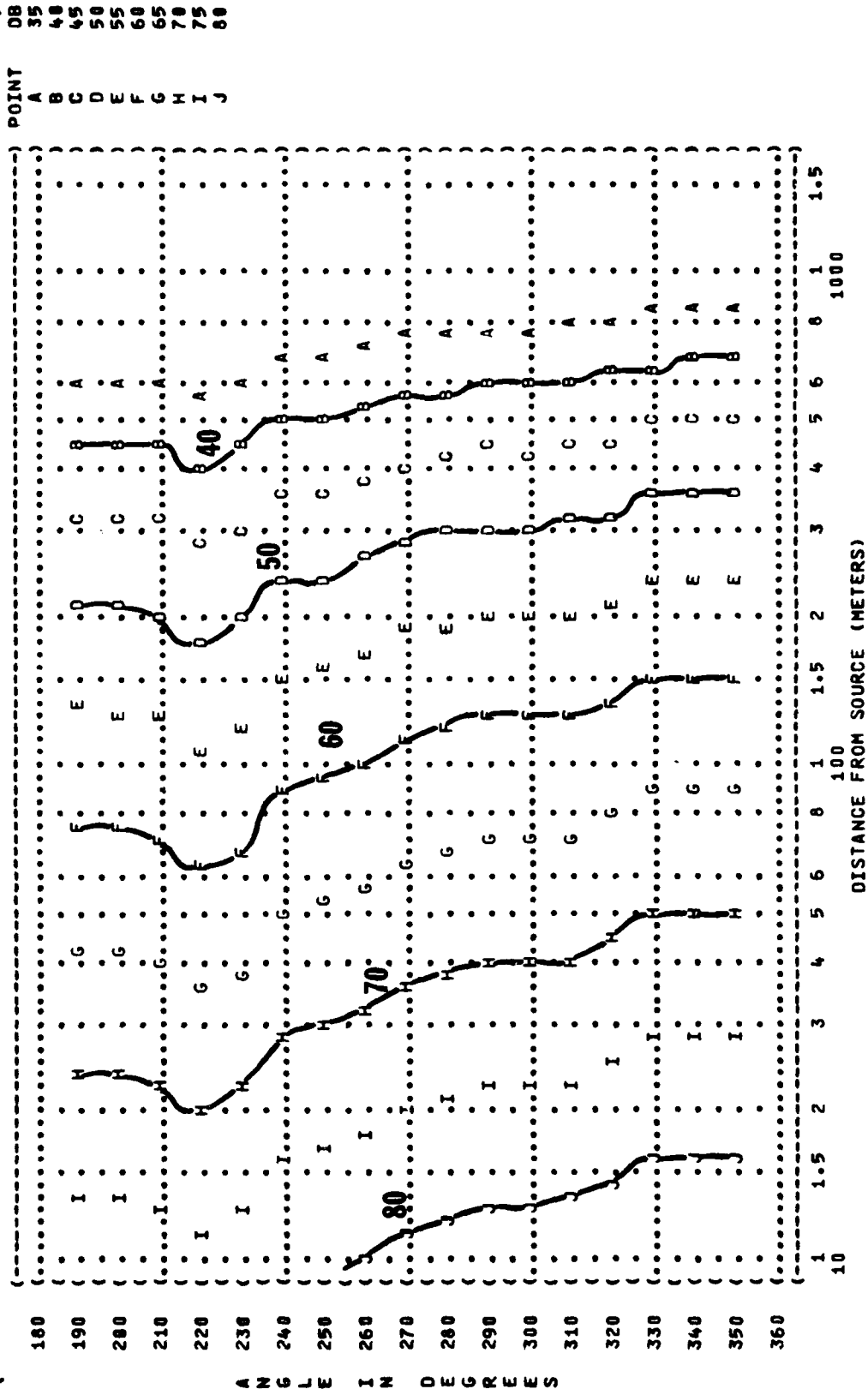


FIGURE: SOUND PRESSURE LEVEL (SPL)
EQUAL LEVEL CONTOURS (DB)
250 HZ OCTAVE BAND

9

IDENTIFICATION:
OMEGA 1.4
TEST BA-000-001
RUN 01
25 JAN 82
PAGE 19

NOISE SOURCE/SUBJECT:

OPERATION:

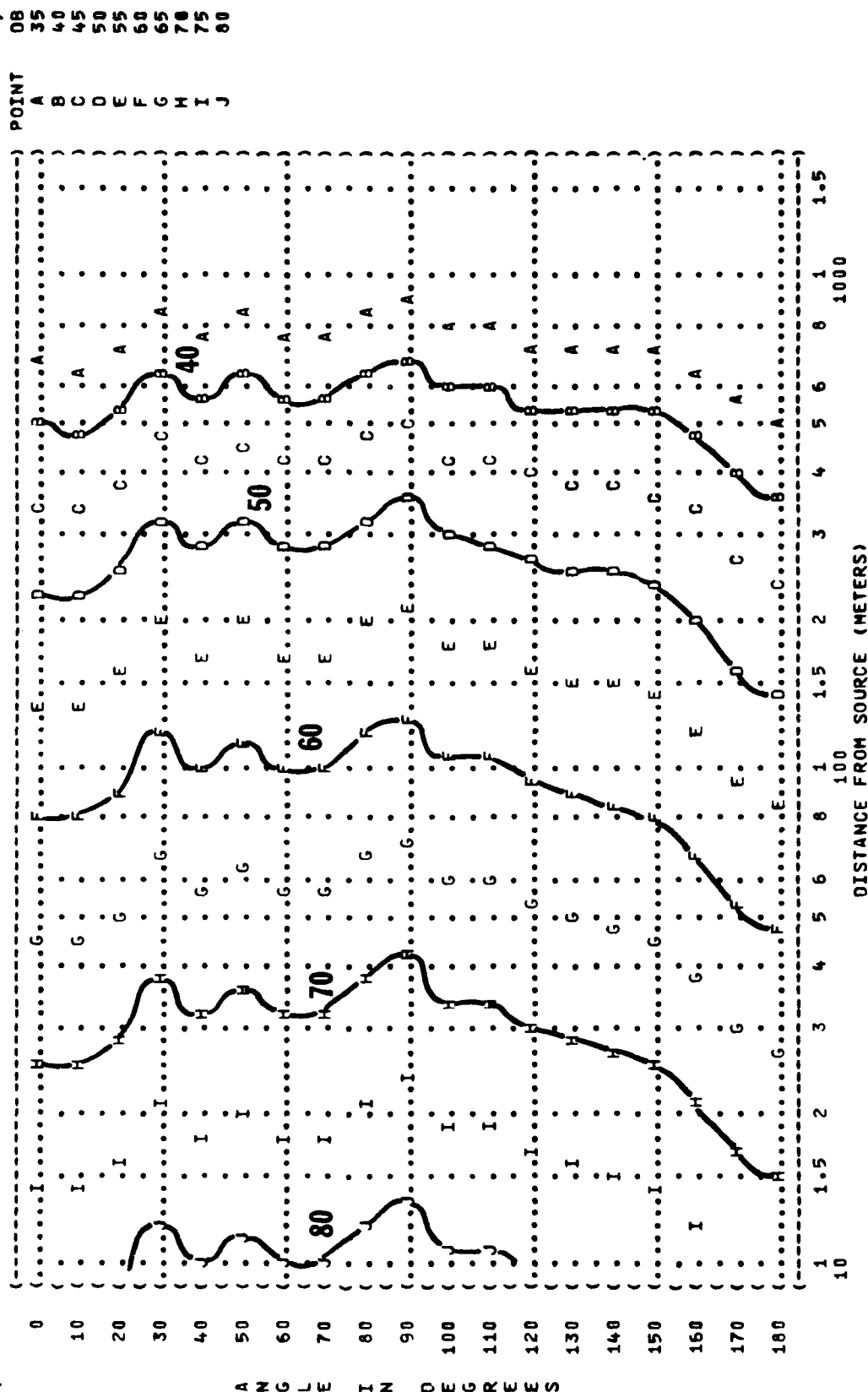
METEOROLOGY:

AF/M32T-1 TESTER,
PRESSURIZED CABIN
LEAKAGE, AIRCRAFT

2400 RPM

TEMP = 15 C
BAR PRESS = .760 M Hg
REL HUMID = 70 %

FAR FIELD NOISE LEVELS



ANGLES

```
( ( FIGURE: SOUND PRESSURE LEVEL {SPL} ) IDENTIFICATION: )
( ( EQUAL LEVEL CONTOURS (DB) ) )
( ( 9 ) OMEGA 1.4 )
( ( 250 HZ OCTAVE BAND ) TEST BA-080-001 )
( ( NOISE SOURCE/SUBJECT: ) METEOROLOGY: )
( ( AF/M32I-1 TESTER, ( TEMP = 15 C ) )
( ( PRESSURIZED CABIN ( BAR PRESS = .760 M HG ) )
( ( LEAKAGE, AIRCRAFT ( REL HUMID = 70 % ) )
( ( FAR FIELD NOISE LEVELS ( ) PAGE 19 )
```

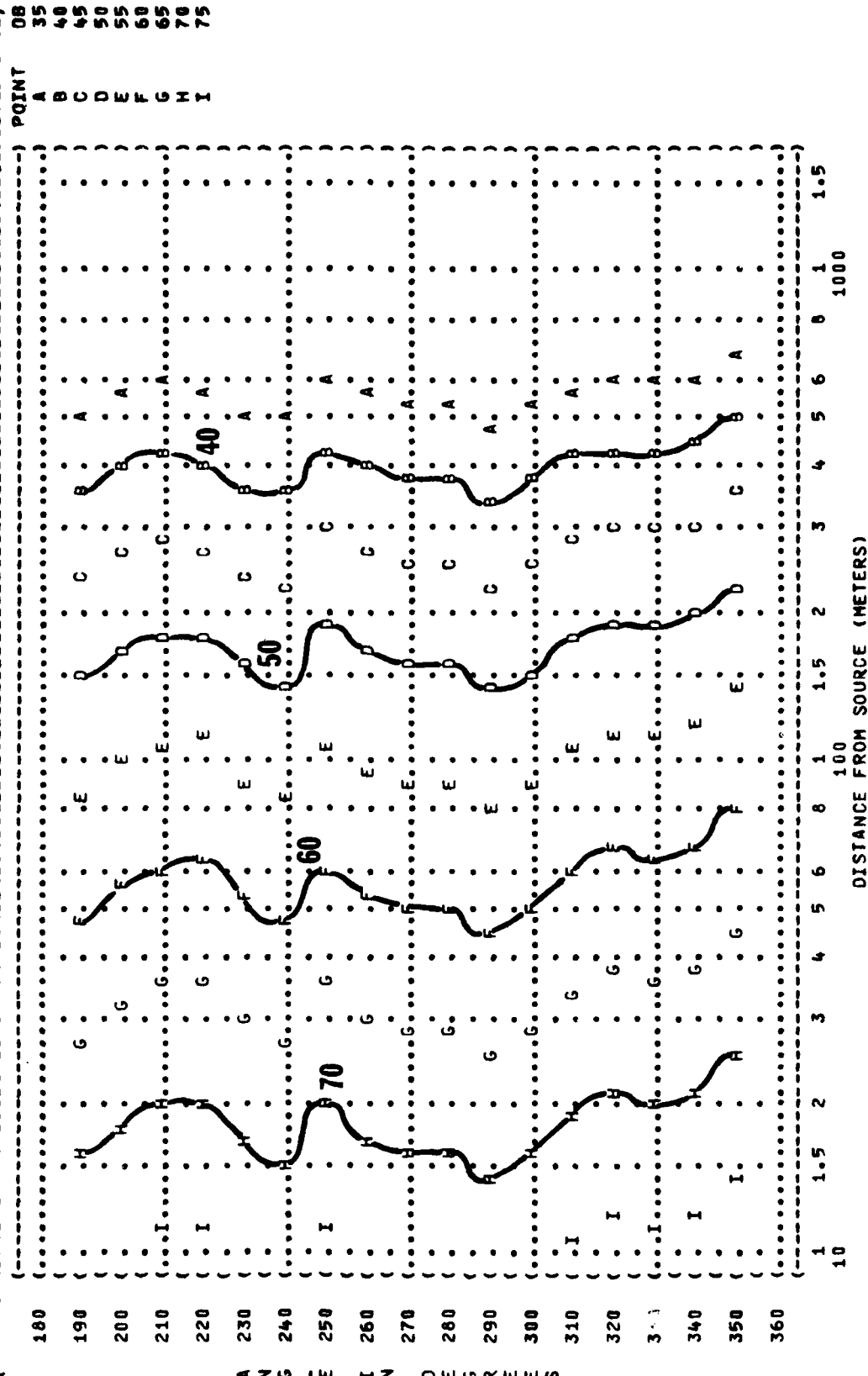


FIGURE 9: SOUND PRESSURE LEVEL {SPL} EQUAL LEVEL CONTOURS (DB) 500 HZ OCTAVE BAND

(	NOISE SOURCE/SUBJECT:
(	AF/M32T-1 TESTER,
(	PRESSURIZED CABIN
(	LEAKAGE, AIRCRAFT
(	FAR FIELD NOISE LEVELS
(	OPERATION:
(	2400 RPM

METEOROLOGY:
TEMP
BAR PRESS
REL HUMID

)) RUN 01
))
)) 25 JAN 82
))
)) PAGE 20



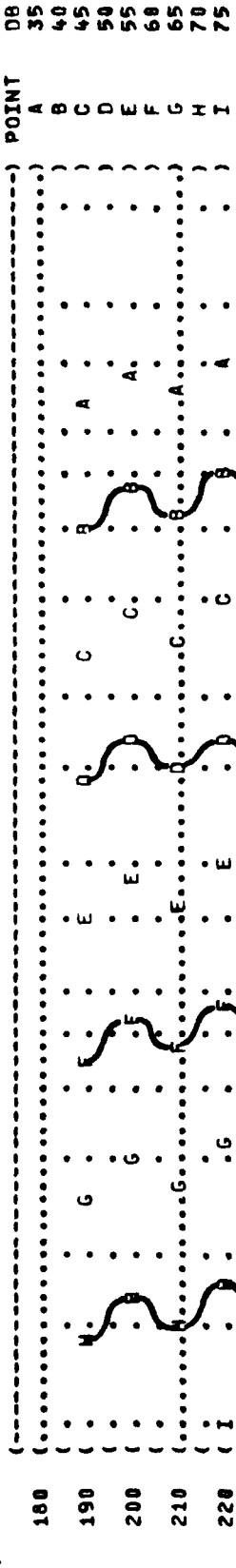
FIGURE: SOUND PRESSURE LEVEL (SPL)
 EQUAL LEVEL CONTOURS (DB)
 500 HZ OCTAVE BAND

9

NOISE SOURCE/SUBJECT: (OPERATION:)
 AF/M32T-1 TESTER, (2400 RPM)
 PRESSURIZED CABIN ()
 LEAKAGE, AIRCRAFT ()
 FAR FIELD NOISE LEVELS ()

METEOROLOGY:
 TEMP = 15 C
 BAR PRESS = .760 M Hg
 REL HUMID = 70 %

IDENTIFICATION:
 OMEGA 1.4
 TEST BA-000-001
 RUN 02
 25 JAN 82
 PAGE 20



DISTANCE FROM SOURCE (METERS)

FIGURE: SOUND PRESSURE LEVEL (SPL)
EQUAL LEVEL CONTOURS (03)
1000 HZ OCTAVE BAND

IDENTIFICATION:
OMEGA 1.4
TEST BA-000-001
RUN 01

NOISE SOURCE/SUBJECT:
AF/M321-1 TESTER,
PRESSURIZED CABIN
LEAKAGE, AIRCRAFT
FAR FIELD NOISE LEVELS

METEOROLOGY:
TEMP = 15 C
BAR PRESS = .760 M HG
REL HUMID = 70 %

PAGE 21

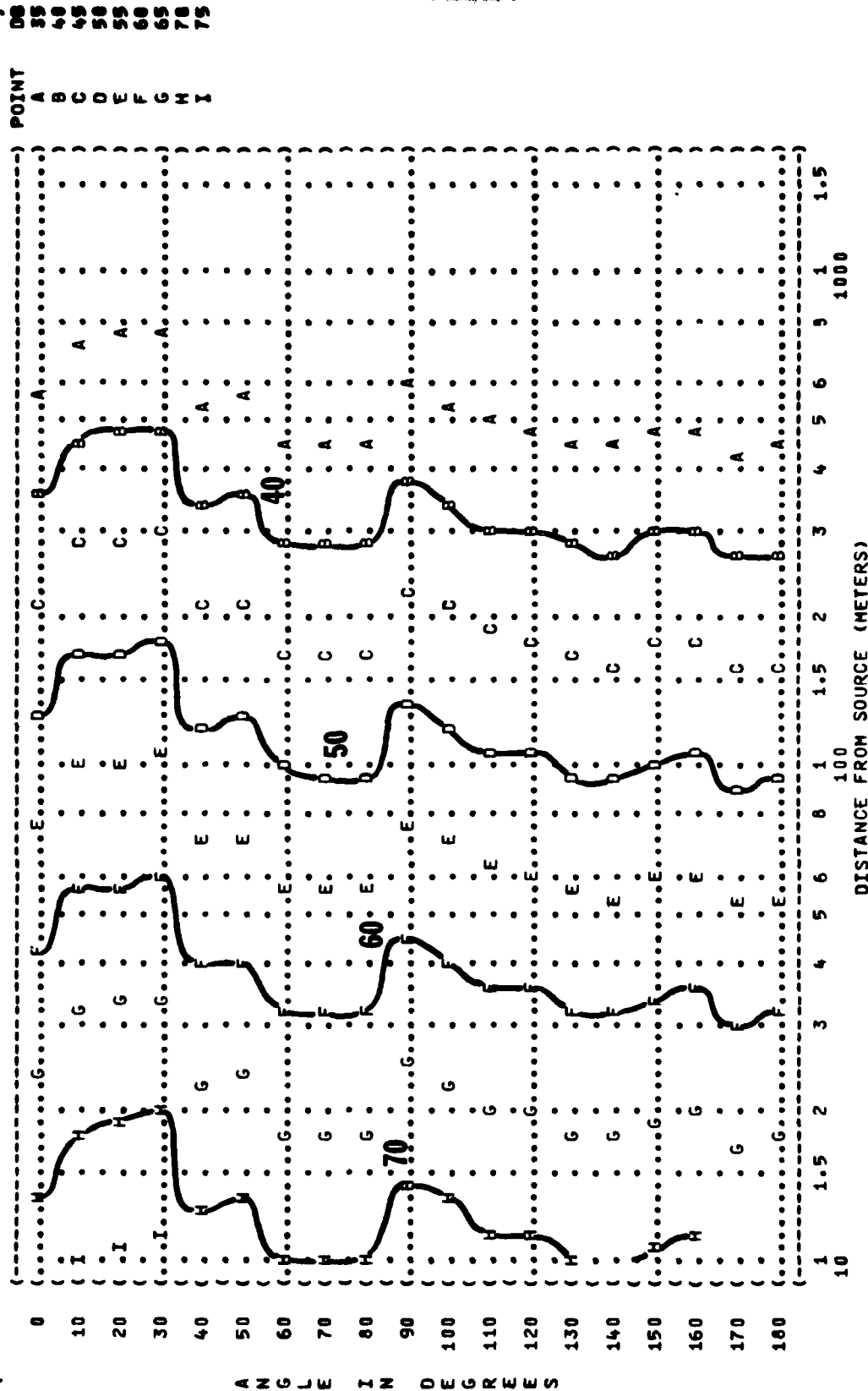


FIGURE: SOUND PRESSURE LEVEL (SPL)
EQUAL LEVEL CONTOURS (DB)

9 1000 HZ OCTAVE BAND

NOISE SOURCE/SUBJECT:

AF/M32T-1 TESTER,
PRESSURIZED CABIN
LEAKAGE, AIRCRAFT
FAR FIELD NOISE LEVELS

OPERATIONS:
2400 RPM

METEOROLOGY:

TEMP = 15 C
BAR PRESS = .760 M HG
REL HUMID = 70 %

IDENTIFICATION:

OMEGA 1.4
TEST BA-000-001
RUN 02
25 JAN 82
PAGE 21

POINT

08

35

40

45

50

55

60

65

70

A

B

C

D

E

F

G

H

100

150

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350

400

450

500

550

600

650

700

750

800

850

900

950

1000

1050

1100

1150

1200

1250

1300

1350

1400

1450

1500

1550

1600

1650

1700

1750

1800

1850

1900

1950

2000

2050

2100

2150

2200

2250

2300

2350

2400

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2500

2550

2600

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2800

2850

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2950

3000

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3100

3150

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4100

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10500

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10600

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10700

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10800

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10950

11000

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11100

11150

11200

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11300

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11400

11450

11500

11550

11600

11650

11700

11750

11800

11850

11900

11950

12000

12050

12100

12150

12200

12250

12300

12350

12400

12450

12500

12550

12600

12650

12700

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12800

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12900

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13000

13050

13100

13150

13200

13250

13300

13350

13400

13450

13500

13550

13600

13650

13700

13750

13800

13850

13900

13950

14000

(	[ [ FIGURE:
(	SOUND PRESSURE LEVEL {SPL}
(	EQUAL LEVEL CONTOURS (DB)
(	9
(-----
(	2800 HZ OCTAVE BAND
(	NOISE SOURCE/SUBJECT:
(	AF/M32T-1 TESTER,
(	PRESSURIZED CABIN
(	LEAKAGE, AIRCRAFT
(	FAR FIELD NOISE LEVELS
)	OPERATION:
)	(2400 RPM
)	METEOROLOGY:
)	TEMP = 15 C
)	BAR PRESS = .760 M HG
)	REL HUMID = 70 %
)	IDENTIFICATIONS:
)	Omega 1.4
)	TEST BA-000-001
)	RUN 01
)	25 JAN 82
)	PAGE 22

```

( ( NOISE SOURCE/SUBJECT:
( ( AF/M321-1 TESTER,
( ( PRESSURIZED CABIN
( ( LEAKAGE, AIRCRAFT
( ( FAR FIELD NOISE LEVELS

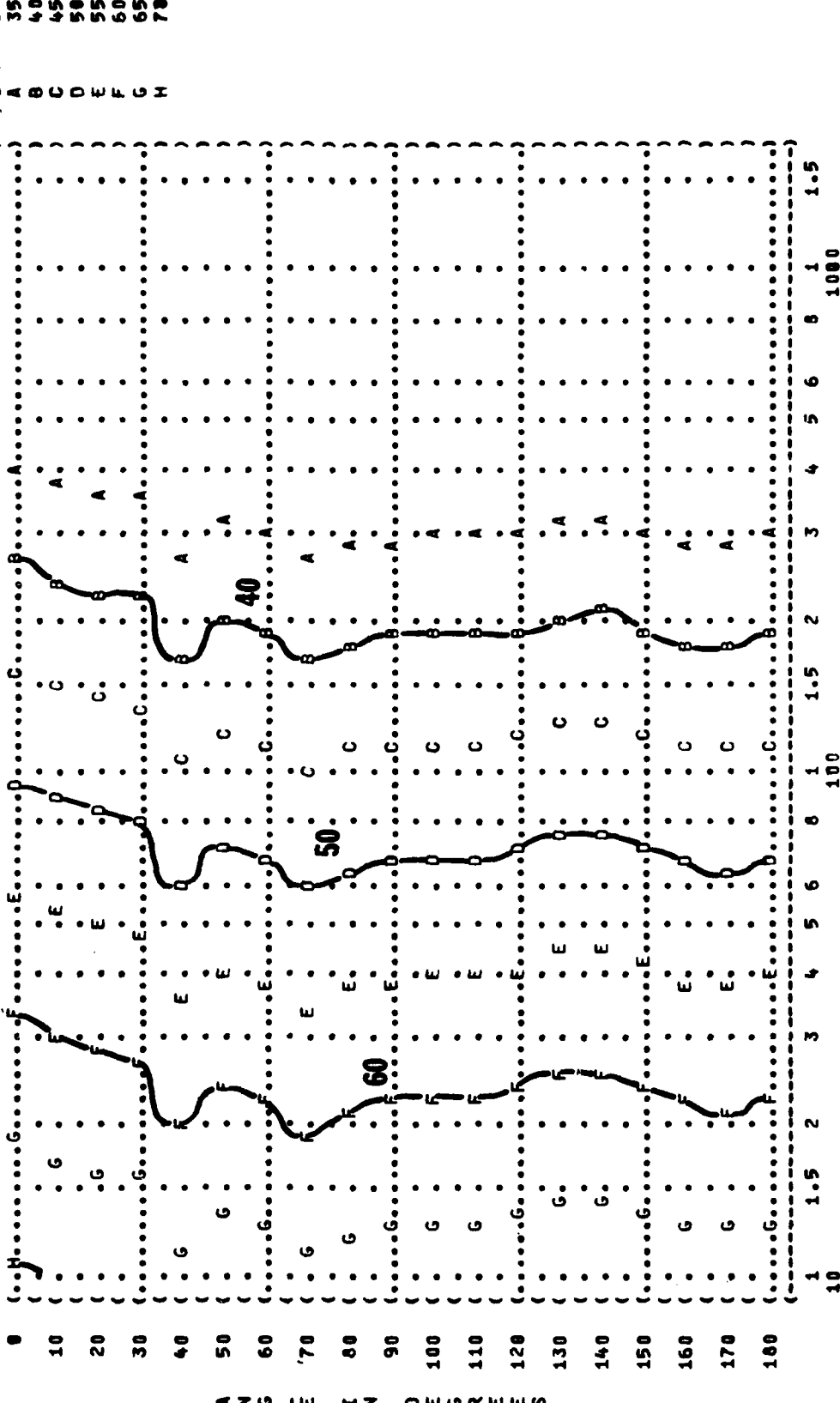
( ( OPERATION:
( ( 2400 RPM

( ( METEOROLOGY:
( ( TEMP = 15 C
( ( BAR PRESS = .760 M Hg
( ( REL HUMID = 70 %

( ( ) RUN 01
( ( ) 25 JAN 82
( ( ) PAGE 22

```

(-----) POINT DB



(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (EQUAL LEVEL CONTOURS (DB)
 (2000 HZ OCTAVE BAND
 () IDENTIFICATION:
 () OMEGA 1.4
 (TEST BA-000-001
 () RUN 02
 (NOISE SOURCE/SUBJECT: (OPERATION:
 (AF/M32T-1 TESTER, (2400 RPM
 (PRESSURIZED CABIN (TEMP = 15 C
 (LEAKAGE, AIRCRAFT (BAR PRESS = .760 M HG
 (FAR FIELD NOISE LEVELS (REL HUMID = 70 %
 () PAGE 22
 ()

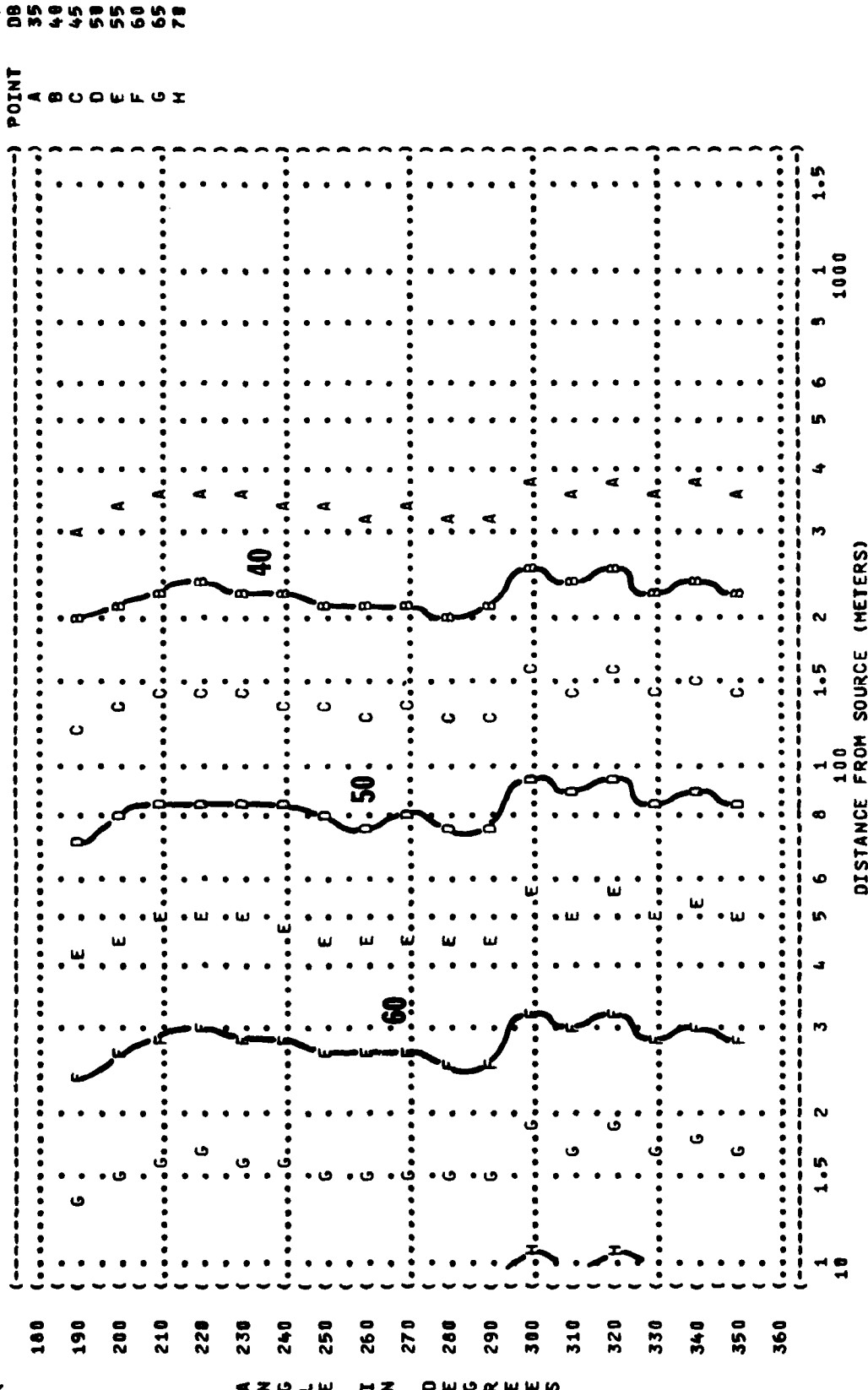


FIGURE: SOUND PRESSURE LEVEL (SPL)
EQUAL LEVEL CONTOURS (DB)

9

4000 HZ OCTAVE BAND

IDENTIFICATIONS:

OMEGA 1.4
TEST BA-000-001

NOISE SOURCE/SUBJECT: (OPERATION:)

AF/M32T-1 TESTER, (2400 RPM)

PRESSURIZED CABIN ()

LEAKAGE, AIRCRAFT ()

FAR FIELD NOISE LEVELS ()

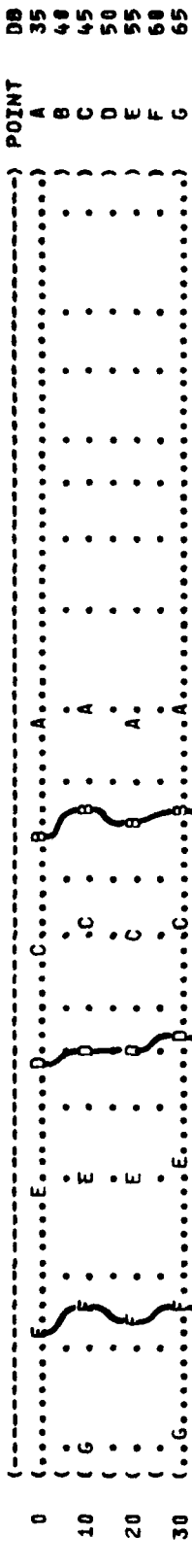
METEOROLOGY:

TEMP = 15 C

BAR PRESS = .760 M HG

REL HUMID = 70 %

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A N G L E I N D E R E S

DISTANCE FROM SOURCE (METERS)

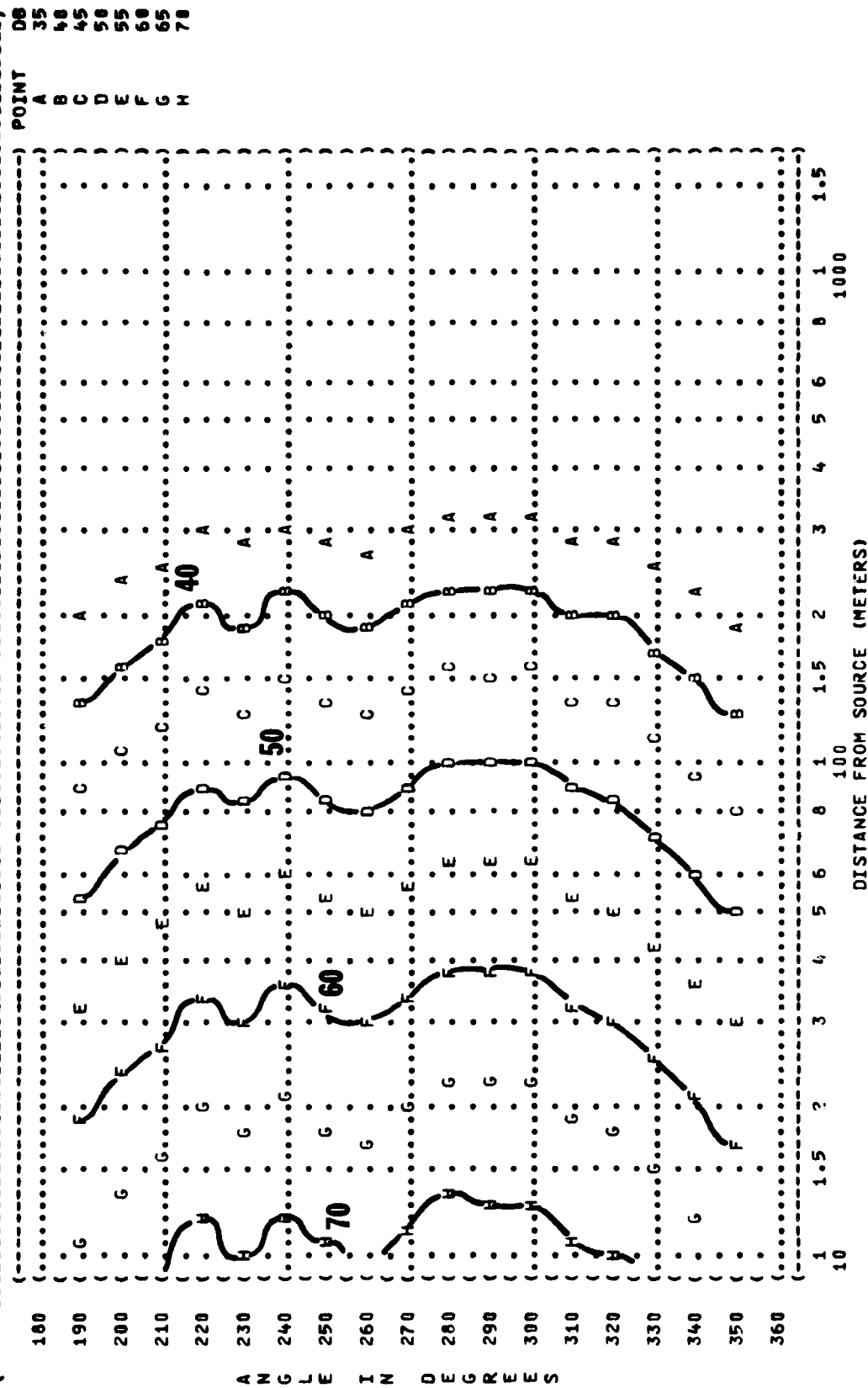
FIGURE: 9 SOUND PRESSURE LEVEL {SPL} EQUAL LEVEL CONTOURS (DB) 4000 HZ OCTAVE BAND

IDENTIFICATION: OMEGA 1.4

1	NOISE SOURCE/SUBJECT:	(	OPERATION:
4	AF/M32T-1 TESTER,	(	2400 RPM
1	PRESSURIZED CABIN	(
1	LEAKAGE, AIRCRAFT	(
1	FAR FIELD NOISE LEVELS	(

) METEOROLOGY:
) TEMP = 15 C
) BAR PRESS = .760 H Hg
) REL HUMID = 70 %

PAGE 23



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